which is called into action by the motion of the string; for it is manifest that, when the string is drawn aside from the straight line into which it is stretched, there arises an additional tension, which aids in drawing it back to the straight line as soon as it is let go. Hooke (*On Spring*, 1678) determined the law of this additional tension, which he expressed in his noted formula, "Ut tensio sic vis," the Force is as the Tension; or rather, to express his meaning more clearly, the Force of tension is as the Extension, or, in a string, as the increase of length. But, in reality, this principle, which is important in many acoustical problems, is, in the one now before us, unimportant; the force which urges the string towards the straight line, depends, with such small extensions as we have now to consider, not on the extension, but on the curvature; and the power of treating the mathematical difficulty of curvature, and its mechanical consequences, was what was requisite for the solution of this problem.

The problem, in its proper aspect, was first attacked and mastered by Brook Taylor, an English mathematician of the school of Newton, by whom the solution was published in 1715, in his *Methodus Incrementorum*. Taylor's solution was indeed imperfect, for it only pointed out a form and a mode of vibration, with which the string *might* move consistently with the laws of mechanics; not the mode in which it *must* move, supposing its form to be any whatever. It showed that the curve might be of the nature of that which is called *the companion to the cycloid;* and, on the supposition of the curve of the string being of this form, the calculation confirmed the previously established laws by which the tone, or the time of vibration, had been discovered to depend on the length, tension, and bulk of the string. The mathematical incompleteness of Taylor's reasoning must not prevent us from looking upon his solution of the problem as the most important step in the progress of this part of the subject: for the difficulty of applying mechanical principles to the question being once overcome, the extension and correction of the application was sure to be undertaken by succeeding mathematicians; and, accordingly, this soon happened. We may add, moreover, that the subsequent and more general solutions require to be considered with reference to Taylor's, in order to apprehend distinctly their import; and further, that it was almost evident to a mathematician, even before the general solution had appeared, that the dependence of the time of vibration on the length and tension, would be the same in the general case as in the Taylo-